WHAT IS CLAIMED IS:

1. A method for providing precise control of magnetic coupling field in NiMn top spin valve head, comprising:

forming at least one copper layer in a NiMn top spin valve;

oxidizing the at least one copper layer; and

depositing remaining layers of the NiMn top spin valve head.

2. The method of claim 1 wherein the at least one copper layer is naturally oxidized for 80 seconds under 8 x 10-5 Torr of oxygen pressure.

3 The method of claim 1 wherein the at least one oxidized copper layer reduces the ferromagnetic coupling field without deteriorating GMR effect or resistance.

4. The method of claim 1 wherein the at least one oxidized copper layer provides a negative coupling field without affecting GMR effect or resistance.

5. The method of claim 1 wherein the at least one oxidized copper layer changes the crystalline texture growth of subsequent magnetic layers.

6. The method of claim 1 wherein the at least one oxidized copper layer provides a negative coupling field that is achieved without affecting a GMR effect or resistance of the NiMn top spin valve head.

7. The method of claim 6 wherein the at least one oxidized copper layer provides stronger growth of NiFe(111) and NiMn(111) with respect to NiFe(200) and NiMn(002) phases.

8. The method of claim 1 wherein the at least one oxidized copper layer improves the interfacial roughness.

9. The method of claim 1 wherein the at least one copper layer is oxidized prior to deposition of magnetic free layers.

10. The method of claim 1 wherein the at least one oxidized copper layer comprises a copper seed layer.

11. The method of claim 10 wherein the at least one oxidized copper layer further comprises a copper spacer layer.

12. The method of claim 1 wherein the oxidation of at least one copper layer provides an approximately 15% increase in amplitude of the output of a NiMn spin valve head at the same coupling field.

13. The method of claim 12 wherein the oxidation of at least one copper layer does not affect asymmetry performance.

14. The method of claim 1 wherein the at least one oxidized copper layer comprises a copper spacer layer.

15. A NiMn top spin valve sensor comprising:

a substrate;

a copper seed layer structure disposed on the substrate;

a ferromagnetic free layer having a magnetic moment that is free to rotate from a first direction in response to a signal field;

a ferromagnetic pinned layer structure having a magnetic moment;

a nonmagnetic electrically conductive spacer layer of copper located between the free layer and the pinned layer structure; and

a NiMn antiferromagnetic pinning layer exchange coupled to the pinned layer structure for pinning the magnetic moment of the pinned layer structure in a second direction;

wherein at least one of the copper seed layer and the nonmagnetic electrically conductive spacer layer of copper is oxidized after deposition and before a subsequent layer is disposed thereon.

16. The NiMn top spin valve sensor of claim 15 wherein at least one of the copper seed layer and the nonmagnetic electrically conductive spacer layer of copper is naturally oxidized for 80 seconds under 8 x 10-5 Torr of oxygen pressure.

17. The NiMn top spin valve sensor of claim 15 wherein both the copper seed layer and the nonmagnetic electrically conductive spacer layer of copper are oxidized after deposition and before a subsequent layer is deposited thereon.

18. The NiMn top spin valve sensor of claim 17 wherein both the copper seed layer and the nonmagnetic electrically conductive spacer layer of copper are naturally oxidized for 80 seconds under 8 x 10-5 Torr of oxygen pressure.

19. The NiMn top spin valve sensor of claim 15 wherein oxidation of at least one of the copper seed layer and the nonmagnetic electrically conductive spacer layer of copper reduces the ferromagnetic coupling field without deteriorating GMR effect or resistance.

20. The NiMn top spin valve sensor of claim 15 wherein oxidation of at least one of the copper seed layer and the nonmagnetic electrically conductive spacer layer of copper provides a negative coupling field without affecting GMR effect or resistance.

21. The NiMn top spin valve sensor of claim 15 wherein oxidation of at least one of the copper seed layer and the nonmagnetic electrically conductive spacer layer of copper changes the crystalline texture growth of subsequent magnetic layers.

22. The NiMn top spin valve sensor of claim 21 wherein oxidation of at least one of the copper seed layer and the nonmagnetic electrically conductive spacer layer of copper results in stronger growth of NiFe(111) and NiMn(111) with respect to NiFe(200) and NiMn(002) phases.

23. The NiMn top spin valve sensor of claim 15 wherein oxidation of at least one of the copper seed layer and the nonmagnetic electrically conductive spacer layer of copper improves the interfacial roughness.

24. The NiMn top spin valve sensor of claim 15 wherein oxidation of at least one of the copper seed layer and the nonmagnetic electrically conductive spacer layer of copper provides an approximately 15% increase in amplitude of the output of a NiMn spin valve head at the same coupling field.

25. The NiMn top spin valve sensor of claim 24 wherein oxidation of at least one of the copper seed layer and the nonmagnetic electrically conductive spacer layer of copper does not affect asymmetry performance.

26. The NiMn top spin valve sensor of claim 15 wherein the at least one oxidized copper layer reduces the ferromagnetic coupling field without deteriorating GMR effect or resistance.

27. A magnetic storage system, comprising:

a magnetic recording medium;

a NiMn top spin valve sensor disposed proximate the recording medium, the NiMn top spin valve sensor, comprising

a substrate;

a copper seed layer structure disposed on the substrate;

a ferromagnetic free layer having a magnetic moment that is free to rotate from a first direction in response to a signal field;

a ferromagnetic pinned layer structure having a magnetic moment;

a nonmagnetic electrically conductive spacer layer of copper located between the free layer and the pinned layer structure; and

a NiMn antiferromagnetic pinning layer exchange coupled to the pinned layer structure for pinning the magnetic moment of the pinned layer structure in a second direction;

wherein at least one of the copper seed layer and the nonmagnetic electrically conductive spacer layer of copper is oxidized after deposition and before a subsequent layer is disposed thereon

an actuator for moving the NiMn top spin valve sensor across the magnetic recording medium so the NiMn top spin valve sensor may access different regions of magnetically recorded data on the magnetic recording medium; and

a data channel coupled electrically to the NiMn top spin valve sensor for detecting changes in resistance of the NiMn top spin valve sensor caused by rotation of the magnetization axis of the free ferromagnetic layer relative to the fixed

magnetization of the pinned layer in response to magnetic fields from the magnetically recorded data.

28. The magnetic storage system of claim 27 wherein at least one of the copper seed layer and the nonmagnetic electrically conductive spacer layer of copper is naturally oxidized for 80 seconds under 8 x 10-5 Torr of oxygen pressure.

29. The magnetic storage system of claim 27 wherein both the copper seed layer and the nonmagnetic electrically conductive spacer layer of copper are oxidized after deposition and before a subsequent layer is disposed thereon.

30. The magnetic storage system of claim 29 wherein both the copper seed layer and the nonmagnetic electrically conductive spacer layer of copper are naturally oxidized for 80 seconds under 8 x 10-5 Torr of oxygen pressure.

31. The magnetic storage system of claim 27 wherein oxidation of at least one of the copper seed layer and the nonmagnetic electrically conductive spacer layer of copper reduces the ferromagnetic coupling field without deteriorating GMR effect or resistance.

32. The magnetic storage system of claim 27 wherein oxidation of at least one of the copper seed layer and the nonmagnetic electrically conductive spacer layer of copper provides a negative coupling field without affecting GMR effect or resistance.

33. The magnetic storage system of claim 27 wherein oxidation of at least one of the copper seed layer and the nonmagnetic electrically conductive spacer layer of copper changes the crystalline texture growth of subsequent magnetic layers.

34. The magnetic storage system of claim 33 wherein oxidation of at least one of the copper seed layer and the nonmagnetic electrically conductive spacer layer of copper results in stronger growth of NiFe(111) and NiMn(111) with respect to NiFe(200) and NiMn(002) phases.

35. The magnetic storage system of claim 27 wherein oxidation of at least one of the copper seed layer and the nonmagnetic electrically conductive spacer layer of copper improves the interfacial roughness.

36. The magnetic storage system of claim 27 wherein oxidation of at least one of the copper seed layer and the nonmagnetic electrically conductive spacer layer of copper provides an approximately 15% increase in amplitude of the output of a NiMn spin valve head at the same coupling field.

37 The magnetic storage system of claim 36 wherein oxidation of at least one of the copper seed layer and the nonmagnetic electrically conductive spacer layer of copper does not affect asymmetry performance.

38 The magnetic storage system of claim 27 wherein the at least one oxidized copper layer reduces the ferromagnetic coupling field without deteriorating GMR effect or resistance.